Claims:

1. (Currently amended) Apparatus for use in dispensing a selected volume~~, in the femtoliter to nanoliter volume range,~~ of each of a plurality of ~~selected~~ liquid samples, comprising

a liquid-support plate having a plurality of liquid-support regions, each capable of supporting a liquid meniscus thereon,

a first electrode containing a plurality of electrode connections, each operatively connected to one of said liquid support region, for electrical contact with a meniscus supported in such region,

a substrate having a first side confronting said plate ~~and an opposite side,~~ and a plurality of sample-holding regions formed in said first side,

a second electrode disposed ~~adjacent one of the two substrate sides, at a spacing from said meniscus of between about 0.1 to 5 mm,~~ between said liquid-support plate and said substrate, said second electrode defining an electrode gap adapted to accommodate movement of a liquid droplet ejected from a liquid-support region to a sample region, and

a control unit including a power source for applying a voltage potential across the two electrodes, ~~a voltage potential having a pulse amplitude or change in pulse amplitude between 0.1-5 kV, and a selected pulse duration in the range 0.1 to 500 msec,~~ thereby to eject a selected volume of the liquid~~, in the femtoliter to nanoliter volume range,~~ from one or more of said liquid-support regions to one or more of said sample-holding regions.

2. (Cancelled) The apparatus of claim 1, wherein said liquid sample is an aqueous, organic, or aqueous/organic sample .

3. (Currently amended) The apparatus of claim ~~2~~ 1, ~~wherein said organic sample is DMSO~~ for use in dispensing a selected volume in the femtoliter to nanoliter volume range, wherein the voltage potential applied across the two electrodes has a

pulse amplitude or change in pulse amplitude between 0.1-5 kV, and a selected pulse duration in the range 0.1 to 500 msec.

4. (Currently amended) The apparatus of claim ~~1~~ 3, wherein said control unit is operable to apply across said first and second electrodes, a voltage potential with a selected pulse duration between about 1-100 msec.

5. (Currently amended) The apparatus of claim 1, wherein the spacing between said meniscus and said second electrode is between about ~~1-3~~ 0.1-5 mm.

6. (Original) The apparatus of claim 1, wherein said liquid-support plate and substrate can be positioned with respect to one another to place each liquid-support region in alignment with a corresponding substrate sample-holding region, creating pairs of aligned liquid-support regions and sample regions.

7. (Currently amended) The apparatus of claim 6, wherein said second electrode includes a single electrode ~~region~~ gap which is relatively movable, with respect to said plate and substrate, to place the electrode ~~region adjacent~~ gap in alignment with pairs of aligned liquid-support regions and sample regions.

8. (Original) The apparatus of claim 7, wherein said control unit is operable to move said electrode ~~region~~ gap successively to adjacent aligned pairs of liquid-support regions and sample regions, and to apply said voltage potential pulse at each successive aligned pair.

9. (Cancelled) The apparatus of claim 6, wherein said second electrode is disposed between said liquid-support plate and substrate, and defines an electrode gap through which a liquid droplet passes when ejected from a liquid-support region to a sample region.

10. (Original) The apparatus of claim 6, wherein said liquid-support plate, second electrode and substrate are all independently movable with respect to the other, under the control of said control unit.

11. (Cancelled) The apparatus of claim 6, wherein said second electrode includes an electrode plate positioned adjacent the substrate's opposite side, and said control unit is operable to apply a voltage potential to all or a selected one or more of said first-electrode connections.

12. (Currently amended) The apparatus of claim ~~11~~ 1, wherein said control unit is operable to apply such voltage potential ~~is applied~~ to said first-electrode connections simultaneously.

13. (Currently amended) The apparatus of claim ~~11~~ 1, wherein said control unit is operable to apply such voltage potential ~~is applied~~ to said first-electrode connections sequentially.

14. (Original) The apparatus of claim 6, wherein said second electrode includes an electrode plate having a plurality of electrode gaps adapted to be positioned with respect to liquid-support plate so as to position each gap in alignment with an associated first-electrode connection.

15. (Original). The apparatus of claim 14, wherein said liquid-support plate and said second-electrode plate are relatively movable, as a unit with respect to said substrate.

16. (Original) The apparatus of claim 14, wherein said control unit is operable, when the second electrode gaps are positioned between corresponding pairs of aligned liquid-support regions and substrate sample regions, to apply such voltage-potential pulse simultaneously to all or a selected one or more of the aligned first-electrode

connections and second-electrode gaps.

17. (Original) The apparatus of claim 14, wherein said control unit is operable, when the second electrode gaps are positioned between corresponding pairs of aligned liquid-support regions and substrate sample regions, to apply such voltage-potential pulse sequentially to all or a selected one or more of the aligned first-electrode connections and second-electrode gaps.

18. (Original) The apparatus of claim 1, wherein each sample-holding region in said substrate includes a defined-size hydrophilic region surrounded by a hydrophobic surface area.

19. (Currently amended) A method of transferring a selected volume~~, in the femtoliter to nanoliter volume range,~~ of each of a plurality of selected aqueous, organic, or aqueous/organic liquid samples, comprising

adding a liquid sample to one or more of the liquid-support regions in the liquid-support plate in the apparatus of claim 1,

positioning the liquid-support plate in said apparatus with respect to the substrate so as to align one or more of the plate liquid-support regions with one of more of the substrate sample-holding regions,

placing the electrode gap in the second electrode in the apparatus ~~adjacent one side of the substrate, and spaced from the liquid-support regions by about 0.1 to 5 mm~~ between the liquid-support plate and the substrate, and positioned therein to accommodate movement of a liquid droplet ejected from a liquid-support region to a sample-holding region, and

applying a voltage potential across the first and second electrodes in the apparatus, ~~a voltage potential having a pulse amplitude or change in pulse amplitude between 0.1-5 kV, and a selected pulse duration in the range 0.1 to 500 msec,~~ thereby to eject a selected volume of the liquid~~, in the femtoliter to nanoliter volume range,~~ from one or more of said liquid-support regions to one or more of said sample-holding

regions.

20. (Currently amended) The method of claim ~~19~~ 21, wherein said applying is with a selected pulse duration between about 1-100 msec.

21. (Currently amended) The method of claim 19, ~~wherein said placing includes placing the second electrode about 1-3 mm from said meniscus~~ for use in dispensing a selected volume in the femtoliter to nanoliter volume range, wherein the voltage potential applied across the two electrodes has a pulse amplitude or change in pulse amplitude between 0.1-5 kV, and a selected pulse duration in the range 0.1 to 500 msec.

22. (Original) The method of claim 19, wherein said positioning is effective to place each liquid-support region in alignment with a corresponding substrate sample region, creating pairs of aligned liquid-support regions and sample regions.

23. (Currently amended) The method of claim 22, wherein the second electrode includes a single electrode gap which is relatively movable, with respect to said plate and substrate, to place the electrode gap adjacent pairs of aligned liquid-support regions and sample regions, and said placing and applying is effective to move the second electrode successively to adjacent aligned pairs of liquid-support regions and sample regions, and to apply said voltage potential pulse at each successive aligned pair.

24. (Cancelled) The method of claim 19, wherein said second electrode is disposed between said plate and substrate, and defines an electrode gap through which a liquid droplet passes when ejected from a liquid-support region.

25. (Currently amended) The method of claim 19, wherein ~~the second electrode includes an electrode plate positioned adjacent the substrate opposite side, and~~ said

applying is operable to apply a voltage potential to all or a selected one or more of the first-electrode connections.

26. (Original) The method of claim 22, wherein said second electrode includes an electrode plate having a plurality of electrode gaps adapted to be positioned with respect to liquid-support plate so as to position each gap in alignment with an associated first-electrode connection, and said applying is effective to apply said voltage potential to a selected one or more of said first-electrode connections.

27. (Original) The method of claim 19, wherein said applying is operable to simultaneously eject a sample from one or more of the plurality of liquid-support regions to the corresponding aligned sample-holding region or regions.

28. (Original) The method of claim 19, wherein said applying is operable to sequentially eject a sample from one or more of the plurality of liquid-support regions to the corresponding aligned sample-holding region or regions.

29 (New) Apparatus for use in dispensing a selected volume of a liquid onto each of a plurality of regions on a substrate, comprising

structure defining a liquid-support region,

a first electrode operatively connected to a liquid support region, for electrical contact with a meniscus supported in such region,

a second electrode carried on said structure and defining an electrode gap aligned with said liquid-support region to accommodate movement of a liquid droplet ejected from the liquid-support region onto such a substrate, and

a control unit including a power source for applying a voltage potential across the two electrodes, thereby to eject a selected volume of the liquid from said liquid-support region onto such a selected region on such a substrate. .

30. (New) The apparatus of claim 29, for use in dispensing a selected volume in

the femtoliter to nanoliter volume range, wherein the voltage potential applied across the two electrodes has a pulse amplitude or change in pulse amplitude between 0.1-5 kV, and a selected pulse duration in the range 0.1 to 500 msec.